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Idaho's 1990 Fuelwood Harvest

William H. McLain



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The Author

William H. McLain is a Forester in the Interior West Resource Inventory, Monitoring, and Evaluation Program at the Intermountain Research Station, Forest Service, U.S. Department of Agriculture, Ogden, UT. His primary area of responsibility is forest health monitoring and special projects. He holds a B.S. degree in forestry from Oklahoma State University, Stillwater, and has done graduate work in economics at Weber State University, Ogden, UT. He began his Forest Service career in 1968 with the Intermountain Station.

Acknowledgments

We appreciate the cooperation of the following groups in supplying data for this report:

1. The owners and operators of Idaho's primary wood processing industries.

2. The commercial fuelwood operators of Idaho who responded to our inquiries.
3. The members of the 400 households sampled in the State.
4. The Idaho Department of State Lands, Forestry Division; the staffs of the many Ranger Districts and National Forests in Idaho; and the Northern Region, Forest Service, U.S. Department of Agriculture.

Research Summary

The estimated fuelwood harvest in Idaho in 1990 was 280,220 cords (22.4 million cubic feet). The fuelwood harvest volume was 7 percent as large as the timber harvested for industrial use (industrial roundwood harvest). The volume of live timber trees harvested for fuelwood was 15,906 cords (1.3 million cubic feet), less than 1 percent of the total 1990 harvest of roundwood products in Idaho.

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Background

The Inventory, Monitoring, and Evaluation Program at the Intermountain Research Station, Forest Service, U.S. Department of Agriculture, is charged with making comprehensive surveys and analyses of the forest resource situation in the Interior West States (fig. 1). Periodic annual estimates and descriptions of wood harvests are part of this mission.

Harvest data for calendar year 1990 were collected in Idaho in 1991 to coincide with the forest inventory of that State. The inventory provided the data to estimate and describe the volume, growth, and mortality of the forests' trees. The harvest data are used to assess and describe changes in the State's inventory due to logging and related activities. The fuelwood harvest, one segment of tree harvesting, is the focus of this report.



Figure 1—Interior West.

Survey Procedures and Responses

Fuelwood harvest data were collected from two distinct groups—commercial operators and households. Commercial operators harvest fuelwood and other roundwood products to sell to consumers or retail outlets. Members of households harvest fuelwood for personal use. These two populations were surveyed in different ways.

Commercial Operators

Personnel of the Bureau of Business and Economic Research, University of Montana, canvassed primary wood processing plants, such as sawmills. Personnel of the Interior West Resource Inventory, Monitoring, and Evaluation Program at Intermountain Research Station canvassed individuals and businesses identified from bidders lists as potential commercial operators. These lists were supplied by personnel of the National Forests in Idaho and Idaho Department of State Lands, Forestry Division.

Primary wood processing plants reported receiving no fuelwood in 1990, although some was generated as mill residue, which is not included in fuelwood harvest estimates. Use of mill residue is found in Idaho's timber production and mill residue (McLain and others, in preparation).

We sent approximately 338 questionnaires to potential commercial operators. Thirty-five reported harvesting, 36 reported no harvest, 25 reported as more complex operations to be included in the primary wood processing plant canvass, and 242 did not respond.

Personal Use Fuelwood Harvest

Personal use fuelwood harvest estimates were obtained by surveying residents of 400 households in Idaho. The population sampled consisted of all residential listings in all Idaho telephone books. A random number generator was used to select the sample, which was distributed throughout the telephone books in proportion to the number of households within the books. Copies of the program used to select the actual sample are available from Charles K. Graham, Statistical Aspects of Monitoring Group, Intermountain Research Station.

Of the 400 households surveyed in the State, 70 reported fuelwood harvests for 1990. The other 330 reported not harvesting.

Results

In 1990 an estimated 280,220 cords, or over 22.4 million cubic feet, of fuelwood were harvested in Idaho (tables 1 to 3). (The fuelwood volume was reported

in cords and converted to cubic feet using 80 ft³/cord, the standard Forest Service conversion rate.) The amount of fuelwood cut equals about 7 percent of the 1990 Idaho timber harvest for industrial use of 310,933 thousand cubic feet (McLain and others in preparation).

Table 1—Fuelwood harvest by county and owner, Idaho, 1990.

County	Owner					
	National Forest	Bureau of Land Management	State	Private	Nonforest ¹	Total ²
-Cords-						
Ada	—	—	—	2,705	2,705	5,410
Adams	10,821	—	—	500	—	11,321
Bannock	2,813	—	—	3,707	—	6,520
Benewah	—	—	—	1,804	—	1,804
Boise	4,451	150	3,607	11,955	—	20,163
Bonner	3,608	—	—	22,046	—	25,654
Bonneville	3,608	—	—	—	—	3,608
Camas	2,705	—	—	—	—	2,705
Canyon	—	—	—	4,509	—	4,509
Caribou	7,215	—	—	11	—	7,226
Cassia	5,412	—	—	—	—	5,412
Clearwater	8	—	122	20,833	—	20,963
Custer	3,105	—	—	—	—	3,105
Elmore	69	—	—	—	—	69
Fremont	10,370	—	—	47,795	108	58,273
Gem	1,884	—	—	1,804	—	3,688
Gooding	—	—	—	—	5,412	5,412
Idaho	6,493	—	—	9,019	—	15,512
Kootenai	9,469	—	—	8,177	—	17,646
Latah	5,459	—	500	10,821	—	16,780
Lemhi	8,553	—	—	—	—	8,553
Lincoln	—	—	—	—	1,804	1,804
Owyhee	—	2	—	—	1,806	1,808
Shoshone	3,106	3,658	—	10,621	—	17,385
Valley	13,988	—	—	902	—	14,890
Total ²	103,137	3,810	4,229	157,209	11,835	280,220

¹Nonforest—lands that do not qualify as forest land.

²Data may not sum to totals due to rounding or truncating.

Table 2—Fuelwood harvest by species and owner, Idaho, 1990.

Species	Owner					
	National Forest	Bureau of Land Management	State	Private	Nonforest ¹	Total ²
Cords						
True fir	207	—	2	5,435	—	5,644
Larch	16,432	1,854	200	31,114	—	49,600
Engelmann spruce	200	—	—	1,353	—	1,553
Lodgepole pine	40,459	—	—	63,263	—	103,722
Western white pine	416	—	140	2,004	—	2,560
Ponderosa pine	9,794	150	3,607	13,191	—	26,742
Douglas-fir	34,703	1,804	280	28,675	—	65,462
Western hemlock	—	—	—	451	—	451
Aspen	926	—	—	—	—	926
Paper birch	—	—	—	2,706	903	3,609
Juniper	—	2	—	—	—	2
Miscellaneous hardwood	—	—	—	9,018	10,824	19,842
Fruit trees	—	—	—	—	108	108
Total ²	103,137	3,810	4,229	157,209	11,835	280,220

¹Nonforest—lands that do not qualify as forest land.

²Data may not sum to totals due to rounding or truncating.

Table 3—Fuelwood harvest by county and species, Idaho, 1990.

County	Species										Fruit trees	Total ¹	
	True fir	Larch	Engelmann spruce	Lodgepole pine	Western white pine	Ponderosa pine	Douglas- fir	Western hemlock	Aspen	Paper birch	Juniper		
Ada	—	—	—	—	—	—	—	—	—	—	—	5,410	—
Adams	—	—	—	125	—	250	10,946	—	—	—	—	—	11,321
Bannock	—	—	—	2,705	—	—	3,791	—	24	—	—	—	6,520
Benewah	—	—	—	1,804	—	—	—	—	—	—	—	—	1,804
Boise	—	—	—	3,658	100	7,379	9,026	—	—	—	—	—	20,163
Bonner	—	10,573	902	5,411	200	—	5,863	—	2,705	—	—	—	25,654
Bonneville	—	—	—	2,706	—	—	902	—	—	—	—	—	3,608
Camas	—	—	—	2,705	—	—	—	—	—	—	—	—	2,705
Canyon	—	—	—	—	—	—	—	—	—	—	—	4,509	—
Caribou	—	—	—	11	—	—	6,313	—	—	—	—	—	7,226
Cassia	—	—	—	3,608	—	—	1,804	—	—	—	—	—	5,412
Clearwater	27	20,745	—	—	42	25	124	—	—	—	—	—	20,963
Custer	—	—	—	400	—	2,705	—	—	—	—	—	—	3,105
Elmore	—	—	—	15	—	—	54	—	—	—	—	—	69
Fremont	—	—	—	58,165	—	—	—	—	—	—	—	108	58,273
Gem	—	—	—	—	—	80	1,804	—	—	—	—	—	3,688
Gooding	—	—	—	—	—	—	—	—	—	—	—	—	5,412
Idaho	—	1,839	—	972	40	7,215	5,446	—	—	—	—	—	15,512
Kootenai	—	7,666	—	4,509	—	1,864	3,607	—	—	—	—	—	17,646
Latah	7	2,915	—	—	115	3,607	10,136	—	—	—	—	—	16,780
Lemhi	200	—	200	4,974	9	2,715	455	—	—	—	—	—	8,553
Lincoln	—	—	—	—	—	—	—	—	—	—	—	—	1,804
Owyhee	—	—	—	—	—	—	—	—	—	903	2	903	—
Shoshone	5,410	5,862	451	—	11,954	—	2,054	—	3,157	451	—	—	17,385
Valley	—	—	—	—	—	902	2,034	—	—	—	—	—	14,890
Total ¹	5,644	49,600	1,553	103,722	2,560	26,742	65,462	451	926	3,608	2	19,842	108
													280,220

¹Data may not sum to totals due to rounding or truncating.

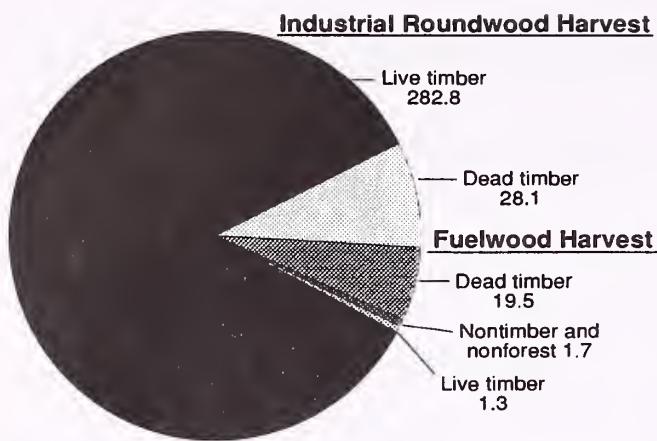


Figure 2—A comparison of the tree class composition of the fuelwood harvest and the industrial roundwood harvest in Idaho, 1990, in million cubic feet.

The 1990 fuelwood harvest was not a significant drain on the growing-stock inventory of Idaho's forests. Nor does it appear to have been in much direct competition with the forest products industry for wood fiber. Most of the fuelwood harvest was dead trees or trees not used to manufacture products, such as juniper, fruit trees, ornamentals, and miscellaneous hardwoods such as ash, locust, and willow.

The fuelwood harvest of standing live trees of timber species used to manufacture products was estimated

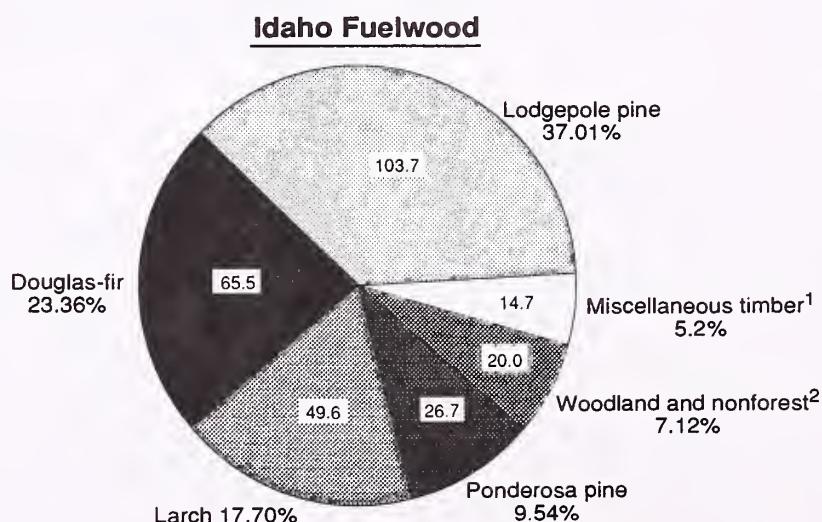
at only 15,906 cords. This is less than 6 percent of the total fuelwood harvest, less than 1 percent of the roundwood harvest of live trees, and less than 1 percent of the total 1990 roundwood production (fig. 2). Of the remaining 264,314 cords of fuelwood harvested, 243,459 were from dead trees of timber species, and 20,855 were from nontimber trees or nonforest land, such as orchards, parks, urban areas, and windbreaks.

Almost 98 percent of the fuelwood was cut for personal consumption. Commercial operators reported harvesting only 6,625 cords.

Lodgepole pine (*Pinus contorta*) accounted for 37 percent of the harvest with 103,722 cords, followed by Douglas-fir (*Pseudotsuga menziesii*), larch (*Larix occidentalis*), ponderosa pine (*Pinus ponderosa*), and miscellaneous hardwoods (tables 2 and 3, fig. 3).

An estimated 56 percent of the fuelwood harvest came from private lands. National Forests provided 37 percent, about 4 percent came from nonforest lands, and 3 percent from State and U.S. Department of the Interior, Bureau of Land Management lands (tables 1 and 2).

The size and distribution of the sample were deemed appropriate to obtain State-level statistics. However, they were insufficient to assess fuelwood harvest volumes at the county level with reasonable confidence. For instance, our sampling picked up no harvest in some counties where we assume some occurred. Recognizing the limitations, harvest volumes by county are presented in tables 1 and 3 and figure 4. These tables provide estimates for comparing the relative scale of harvests among counties.



¹True fir, white pine, spruce, hemlock, aspen, and paper birch.

²Fruit trees, juniper, ash, locust, willow, and timber species on nonforest land.

Figure 3—Species distribution of the fuelwood harvest in Idaho, 1990, in thousand cords.

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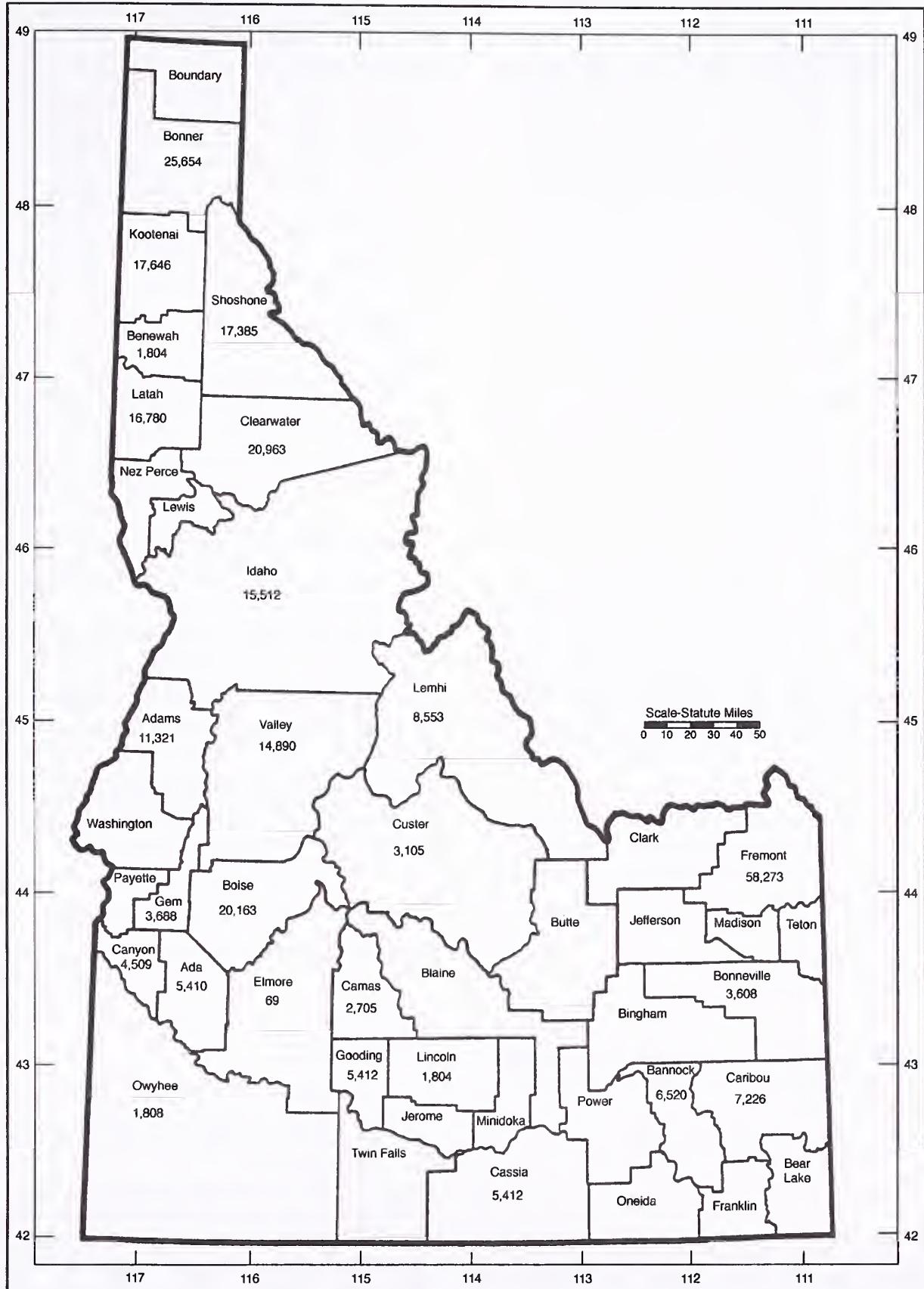


Figure 4—Idaho fuelwood harvest by county group in cords, 1990.

Expansion of Household Sample

The following procedure was used to expand the sample statistics to obtain the estimate of the total volume of fuelwood harvested by all the households in Idaho.

n = number of households in sample

nc = number of households in sample that harvested fuelwood

ΣX = reported harvest by nc in cords

$\bar{X} = \frac{\Sigma X}{nc}$; mean harvest, in cords, by nc

N = estimated number of households in all Idaho telephone books

$NC = N(\frac{nc}{n})$; estimated number of households in Idaho phone books cutting fuelwood

VOL = estimated volume of fuelwood harvested by N

$VOL = NC(\bar{X})$

P = Bureau of Census estimate of the number of households in Idaho

K = population adjustment factor; used to expand the estimate of harvest by the households in the telephone books to the estimate of harvest by all households in Idaho

$K = \frac{P}{N}$

$TOT VOL^1$ = estimate of the total volume harvested by households in Idaho for personal consumption

$TOT VOL = VOL(K)$

or

$TOT VOL = \frac{P}{n}(\Sigma X)$

The volumes reported in the cells of tables 1 through 3 were found by multiplying reported volumes by the expansion factor:

Expansion factor = $\frac{TOT VOL}{\Sigma X} = \frac{P}{n}$

¹This is not necessarily the volume harvested in Idaho. Some of the fuelwood harvest reported by the population sampled took place in adjacent states. These "outside" harvest volumes were included in calculations of the mean (\bar{X}) and are thus included in all computations involving \bar{X} . This does not, however, affect the calculation of the harvest volume in Idaho.

For the 1990 harvest of fuelwood by households, the following were computed:

$n = 400$

$nc = 70$

$\bar{X} = 4.36243$

$N = 338,439$

$NC = 59,227$

$VOL = 258,372$

$P = 360,723$

$K = 1.06584$

$TOT VOL = 275,385$ cords

Expansion factor = 901.8

Standard Error

The variances, standard errors, and confidence intervals of the estimates of the total volumes harvested by households were found as follows:

VAR = variance of the volume harvested by the sample; computed using the number of households that harvested (nc)

$VAR TOT VOL$ = variance of the total volume

$VAR TOT VOL = \left[\frac{(\bar{X})^2(NC)(N - NC)}{n} + \frac{(NC)^2(VAR)}{nc} \right] (K^2)$

Std. error $TOT VOL$ = standard error of the total volume

= $\sqrt{VAR TOT VOL}$

For 95 percent confidence interval of the estimate of the total volume:

$TOT VOL \pm 2$ (std. error $TOT VOL$)

For the 1990 harvest of fuelwood by households, the following statistics were calculated:

$VAR TOT VOL = 2,824,377,344$ cords

Std. error $TOT VOL = 53,145$ cords

95 percent confidence interval = $\pm 106,290$ cords
(± 37.9 percent)

Terminology

Commercial fuelwood operators—Those who harvest fuelwood to sell to dealers or consumers. Includes loggers who harvest fuelwood along with sawlogs and other products.

Cord—A stack of wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet. A conversion factor of 80 cubic feet of solid wood per cord is used in this report.

Forest lands—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area

for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Fuelwood production—Fuelwood harvest. The fuelwood portion of roundwood production. The fuelwood volume of roundwood products.

Growing-stock (volume)—The net cubic-foot volume of wood in live trees from a stump 1 foot high to 4.0-inch diameter top, outside bark. Such trees must be timber trees, those traditionally harvested for lumber products (excludes pinyon, juniper, ornamentals, and fruit trees), must have a central stem at least 5 inches in diameter at breast height (d.b.h.), and must meet specified standards of quality and vigor, thus excluding cull trees.

Industrial roundwood production—The conversion of trees into industrial roundwood products. The volume of industrial roundwood products resulting from harvest.

Industrial roundwood products, or industrial wood products, or industrial roundwood, or timber products—Includes sawlogs, pulpwood bolts or logs, house logs, veneer logs, utility poles, building poles, corral poles, posts, excelsior bolts, ties, mine timbers, and pilings. Does not include fuelwood.

Nonforest lands—Lands not qualifying as forest lands. In this publication, references to nonforest lands mean orchards, parks, urban areas, and windbreaks.

Nontimber trees—Trees other than timber trees.

Nontimber tree species are pinyon, juniper, and all hardwood species except cottonwood, aspen, and paper birch.

Primary wood processing industry (or plants)—Generally, includes sawmills; fiber board, veneer, and plywood plants; pulp mills; house log plants; post and pole yards; post and pole treating plants; excelsior plants; tie yards; and producers of pilings.

Roundwood production—The production of industrial roundwood and fuelwood. The conversion of trees into roundwood products. The volume of roundwood products resulting from harvest.

Roundwood products, or roundwood—Includes sawlogs, pulpwood bolts or logs, house logs, veneer logs, utility poles, building poles, corral poles, posts, excelsior bolts, ties, mine timbers, pilings, and fuelwood. Differs from industrial roundwood products because roundwood products include fuelwood.

Timber production—Timber products; same as industrial roundwood products or industrial roundwood production. Does not include fuelwood.

Timber species—Those tree species traditionally harvested for timber products, such as ponderosa pine, Douglas-fir, lodgepole pine, cottonwood, aspen, and paper birch. Excludes pinyon, juniper, and miscellaneous hardwoods such as oaks, shade trees, ornamentals, and fruit trees.

Reference

McLain, William H.; Keegan, Charles E., III.; Wichman, Daniel P. [In preparation]. Idaho's timber production and mill residue, 1990. Resour. Bull. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

Appendix: Idaho Directory of Commercial Firewood Cutters

County	Firewood cutter	County	Firewood cutter
Ada	George and Wilma Wilhite 5577 Murphey Lane Rt. 1 Kuna, ID 83634 208-466-1776	Canyon	H & D Forest Products 6819 East Greenhurst Rd. Nampa, ID 83651
Bannock	Thomas E. Nash 4530 South 5th D-10 Pocatello, ID 83202 208-232-3832	and	8595 Foothill Rd. Middleton, ID 83644 208-467-6019 208-585-2645 Dale Lousignont, Owner
Benewah	Roland Logging Company P.O. Box 392 St. Maries, ID 83861 208-245-5288 Charles Mike Roland, Owner	Caribou	Jenkins Trucking Box 171 Freedom, WY 83120 208-873-2888 Lynden Jenkins, Owner
Boise	Jackson Logging Box 9 Idaho City, ID 83631 208-392-4445 Roger E. Jackson, Owner	Clearwater	Leach Logging Box 1191 Orofino, ID 83544 208-476-7132 Ted Leach, Owner
Boise	K & S Enterprises P.O. Box 8713 Boise, ID 83707 Location: Horseshoe Bend, ID 208-375-6055 Lonnie J. Stoner, Owner	Elmore	Sayko's Woodyard Box 78 Atlanta, ID 83601 208-864-2153 Richard Sayko, Owner
Bonneville	Call Forest Products 6030 South Yellowstone Hwy. Idaho Falls, ID 83402 208-523-9505 Bill K. Shurtleff, Owner	Idaho	McCoy Enterprises Inc. Rt. 1 Box G Kooskia, ID 83539 Gene McCoy, Owner
Canyon	Jones Firewood 2107 Linden Manor Apt. 203 Caldwell, ID 83605 Dean E. Jones, Owner	Idaho	Mark Swanson Logging P.O. Box 1578 Lewiston, ID 83501 Location: Elk City, ID 208-842-2263 509-758-3455 Mark Swanson, Owner
Canyon	W. J. (Bill) Johns 108 22nd Ave. S. Nampa, ID 83651 208-466-9312	Idaho	Woodpicker Logging Box 175 Elk City, ID 83525-0175 Jerry Lockett and Mick Forsaman, Owners

(con.)

Appendix (Con.)

County	Firewood cutter	County	Firewood cutter
Kootenai	RCM Timber, Slash & Firewood P.O. Box 401 Hayden, ID 83835 208-687-2100 Butch Marks, Owner	Lemhi	Salmon Intermountain Inc. Box 928 Salmon, ID 83467 208-756-6293 Dallas Olson, Owner
Kootenai	Steve's Firewood & Logging 853 Government Way Coeur d'Alene, ID 83814 208-664-6608 Steve Willeck, Manager	Lewis	Nezperce Associated Students P.O. Box 279 Nezperce, ID 83543 Location: Nezperce School District 302 Nezperce, ID 83543 208-937-2551 Robert Pratt, Manager
Latah	Starwood Products Rt. 1 Box 111 Juliaetta, ID 83535 208-276-4401 Albert Nye, Owner	Nez Perce	Bill Boyer Rt. 1 Box 93 Lenore, ID 83541 208-836-5753
Lemhi	Stroud Logging P.O. Box 162 Leadore, ID 83464 208-768-2281 James B. Stroud, Owner	Nez Perce	D D & L Firewood 1531 Richardson Avenue Lewiston, ID 83501 208-743-3453 Delynn F. Russell, Owner
Lemhi	England Welding Rt. 1 Box 183-1 Salmon, ID 83467 Location: Cherokee Lane Salmon, ID 208-756-4359 Vern England, Owner	Owyhee	Robison Firewood P.O. Box 157 Grand View, ID 83624 208-834-2280 Raymond Robison, Owner
Lemhi	Perry Logging Rt. 1 Box 155A Salmon, ID 83467 208-756-3166 Jerry Perry, Owner	Valley	Gary Peterson Logging, Inc. HC 71 Box 4660 Cascade, ID 83611 208-382-4315 Gary and Clydie Peterson, Owners

McLain, William H. 1996. Idaho's 1990 fuelwood harvest. Resour. Bull. INT-RB-84. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 9 p.

Highlights the 1990 harvest of fuelwood in Idaho by commercial fuelwood harvesters and those cutting for home consumption. Presents harvest volumes by species, county, and owner. Lists a directory of commercial fuelwood harvesters and describes the methods of data collection and compilation.

Keywords: firewood, growing stock removals, round wood production, nonindustrial roundwood production



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